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Abstract: One of our main activities, as human beings, consists of the attempt to explain and to understand what is not known (yet) by what is already known and familiar. Our explanations are often causal which is why it is frequently considered that to explain a phenomenon means to describe its causes. But we must keep in mind the idea that explaining what is new and we do not yet through known notions is a complex and risky process. Some of the most common risks consist of the fact that sometimes, through such explanation we don’t succeed to bring any extra knowledge and other times we fail to grasp the real causal connections between the phenomena, which lacks our judgments of truth value. The modifications of the concept of causality due to the new discoveries of physics added to our tendency to invent causal explanations is confusing in science as well as in philosophy. In the case of the judicial philosophy for instance, the manner in which the relations and social phenomena are understood and explained have direct influence over the legal regulation, making the law enforcement more or less efficient. In this paper we intend to analyze to what extent our willingness to provide explanations for everything that happens affects the concept of causation and whether these difficulties can be related to causal inference. In classical logic, the specialists analyzed the causal inferences and the logical rules implied in order to achieve reliable conclusions and we will refer to them with the purpose of avoiding errors.

Keywords: causality, quantum physics, causal inferences, explanation, error, legal philosophy.

1. Introduction

Postmodernism is a philosophical current difficult to define. Mainly, it is based on the idea that there are no concepts with absolute value and everything we know is built by the human mind and understood as it happens (or is known). Postmodernists deny the modern social paradigm in which classical science with its principles was dominant. For postmodernism, knowledge of the inner and outer world is an ongoing
process, a product of the human mind in which imagination and our way of relating to the world play a key role.

In this paper we aim to draw attention both to the fact that the idea of classic epistemology involving the possibility of objective scientific knowledge of the world is an idealization and also to the danger involved by the belief that gaining knowledge is possible by simply devising explanations of observed phenomena as the ability to invent or conceive explanations is not a guarantee of their validity or the discovery of the causal link between phenomena.

Quantum indeterminism has changed the perception and understanding of determinism and causality. In this context, the causal explanation has new meanings. From this perspective, and also from the postmodern point of view, the conception about reality and our knowledge of it modified as the outer world becomes intelligible by building its image through the observer’s language. In this system we cannot speak of an objective knowledge of reality, independent of the knowledgeable subject, but of a social construction of reality through language that gives meaning, and in this process are included the notions of causal explanation and causality that we consider necessary.

2. Purpose and Traps of the Explanation

To seek for the meaning of our existence, in a huge universe, but still (to all appearance) with a limited lifetime, it is probably the main engine of the need to conceive explanations for what is happening. First of all, we want to understand what the meaning of life is and then, we are permanently searching for signs that, beyond everything that passes away, there is something perennial, eternal and immutable. We would expect that the eternal something to be each of our persons, but as we are aware that the body is subjected to the passing and to the Second Law of Thermodynamics, we remain with the hope that the soul may have another fate.

Basically, the great director of what we can know is the human mind and the brain mechanisms are, in defiance of all scientists' efforts, still mysterious. Sometimes, driven by a desire to obtain a certain answer or for fear of a potential danger, we can easily ignore obvious aspects of reality or make up things that do not exist. Science itself is full of such explanations and distortions of reality, and this goes also for our individual histories. For example, the geocentric theory, according to which the Earth is at the center of the Universe, and all other planets rotate around it together with the Sun dominated human mind more than a thousand two hundred years.
Interestingly, the geocentric thesis was scientifically reasoned in detail, and the planets "orbits" were meticulously calculated, so it cannot be said that it was a rootless belief.

In other terms, we see what our mind can perceive and process. And "our mind does not seem to be made for thinking and introspection. If that had been so, today it would be easier for us, but in this case we would not find ourselves here, and I would not talk about it - my imaginary, thoughtful and introspective ancestor would have been eaten by a lion, while his cousin, who did not think but react faster, would have run away to hide. Take into account that thinking is time consuming and is generally a high waste of energy" (Taleb, 2010, p. 21).

The scientific knowledge of the world strives for getting coherent explanations that would lead to an adequate understanding of what is around us. But we should have in view that this is achieved by human individuals, and the mind of each of us "evaluates everything depending on the potential threat or benefit for each, then adapting the behavior so as to obtain as much as possible of what is good and as little as possible of what is bad " (Haidt, 2016, p. 80). Howard Margolis, in its study named Patterns, Thinking and Cognition, wrote that there are two different types of "cognitive processes that activate when we issue judgments and solve problems: to see that and to explain why. To see that is the identification of patterns that our brain has been doing for hundreds of millions of years. Even the simplest animals are equipped so as to react to certain stimuli (such as light or sugar) with certain behaviors (such as drawing away from the light or stopping and eating the sweet food). [...] Margolis also called this type of thinking intuitive" (Haidt 2016, p. 67). Next, Margolis defines to explain why as "the process through which we describe how we believe we have reached a judgment or how we reckon that another person reaches that judgment" (Margolis, 1987).

For example, Albert Einstein did not accept the validity of quantum theories (which are mathematically argued) because their content contradicted its beliefs and intuitions about the Universe. Even if he failed to scientifically invalidate the theory, he did not stop trying to build a scientific argument (that is, an explanation) that would correspond to his vision.

What psychologists say is that we form our opinions quickly and intuitively regarding what surrounds us or is happening to us, and then make explanations to back up these intuitions. To this inclination of us to explain what we believe (or is suitable to us), not what is virtually true, Nassim Taleb also refers when he warns us that "mind is a wonderful machinery of producing explanations, capable to give sense to almost all things, and to
make explanations for all sorts of phenomena, but generally incapable of accepting the idea of unpredictability. [...] Moreover, the more intelligent a person is, the more coherent [is] the explanation. More worrying is that all these convictions and stories have, apparently, logical consistency” (Taleb 2010, p. 38).

All these do not mean that the causal explanations do not exist or are not valid, but simply that it is only suited to pay attention both to our own explanations (especially to those of our likes) in order to keep in the field of knowledge only the proven real causal relationships and to eliminate justificatory mental constructions that only have the role of supporting our intuitive beliefs, determined by emotions, feelings or familiar things.

3. Causal Inferences

The reasoning through which there can be determined the causal links existing among certain phenomena around us are called causal inferences. Generally speaking, by inference is understood the valid logical derivation of a sentence called conclusion, out of one or more sentences called premises. In classical logic it is established the distinction between deductive inferences (within which it starts from universal premises and is derived a particular conclusion) and inductive inferences (within which the premises are particular and the conclusion is a particular or universal sentence). The essential difference between induction and deduction refers to the fact that the latter is certain (provides us indubitable conclusions) whereas induction has an essentially uncertain nature (we cannot be 100% sure that our generalization is valid).

Inductive knowledge is based on the observation of a series of particular phenomena of the same type and then the generalization of essential (considered) properties of those phenomena to all phenomena or objects of a category (which may be finite or infinite). This kind of knowledge can prove to be extremely limited and fragile. For instance, for thousands of years it has been believed, based on the observations, that all swans are white. But "a single observation can make void a general statement derived from the confirmations given by seeing millions of white swans over the millennia. It takes only one [...] black bird" (Taleb, 2010, p. 15).

Today, this division of reasoning into inductive and deductive has lost the certain character of which it has enjoyed for many centuries: "it has recently been discovered that mathematical thinking is deductive without being syllogistic and that experimental investigation passes from facts to
laws without generalizing at all times. It became obvious that classical definitions differentiated only the species of deduction and induction, more or less correct" (Botezatu, 1997, p. 233). The essential difference between induction and deduction refers to the fact that the premises and the conclusion of a deduction are equally certain, while the premises of an inductive reasoning can be certain and its conclusion uncertain. The conclusion of an inductive reasoning has some degree of uncertainty about its truth, even though the premises are true, it can be proven to be false. At this point of the argumentation, it might be given the appearance that there is an identity between inductive inferences and probable inferences, which is wrong since, in particular situations, "a deductive inference may have a conclusion of probability, but established with all certainty" (Botezatu, 1997, p. 234).

But if we enter in the deduction field all those statements whose conclusions are certain and leave the others to induction, the old classifications no longer operate: for example, full induction should be considered a kind of deductive reasoning, which is an obvious forcing of concepts. Ultimately, in order to avoid ambivalences and paradoxes, contemporary logic has divided reasoning into deductive and non-deductive.

In this very complicated context of deductive, completely inductive, incompletely inductive and probable inferences, causal inferences find also their place. Causal inferences are also complicated, especially since, through them, it is intercepted the causal relation between phenomena or events, a relation that is sometimes controversial and difficult to identify.

The way in which phenomena occur in reality is far from being simple and clear; usually, causal relations overlap and combine with each other so that, both in scientific research and in everyday life, the situation is complicated and undecipherable. In order to separate the causality (meaning that there is a necessary connection between the antecedent and the subsequent, according to which if the cause event occurs, then, necessarily, it is followed by the effect event) from other types of relations that can be established among them, the specialists identified a series of specific features of this: genetic and constant and active character. In order to establish causal relations among phenomena, specialists use inductive reasoning. "Inferences by means of which we establish causal connections - the so-called inductive methods - rely on the axiom that, if there is a causal relation, then those phenomena are present together, appear and disappear together, vary together. These inferences are therefore made up of sentences of existence, in their various forms: sentences of presence, of appearance and disappearance, of variation" (Botezatu, 1997, p. 245).
Through causal inferences we can establish that the cause-phenomenon and effect-phenomenon appear, disappear and vary together. However it is very difficult to be certain that we have discovered the unique and real cause of the effect-phenomenon or just one of several possible causes or a simple condition as "the conditions [...] accompany the effect like the cause and behave in causal reasoning similar to the cause" (Botezatu 1997, p. 246). The difference between cause and condition consists in the fact that the cause proper of the phenomenon remains constant, while the conditions may differ. For example, tides are smaller when the Moon's attraction opposes Sun's attraction and larger when the two forces draw together (the main cause of the tides being the attraction force of the Moon, which is much closer to Earth than the Sun).

When the effect-phenomenon can be produced by several different causes, we cannot be sure if we have established the truth: the absence of a cause not being equivalent to the lack of causal relation or to the fact that the phenomenon that has not occurred is not one of the possible causes of the studied effect.

Obviously, the simplest situation is that where the effect-phenomenon has a unique cause, but this happens pretty rarely. And, we just need to be sure we have identified it properly. In any case, in all possible situations - single cause, plurality of causes, existence of both the causes and the conditions – after having been established the causes, conditions and effect, we have to check, through other methods, the reliability of our discoveries.

The causal inference is based on the "dependence between the causal relation and the presence (appearance, disappearance, variation) together of the effect and cause phenomena. Existence of a causal relation is the condition, and co-presence (co-appearing, etc.) is the consequence. But the condition is only sufficient, not also necessary, since co-presence (co-appearing, etc.) can also be the result of happening, a mere coincidence in time" (Botezatu 1991, p. 247). Thus, the two modes - modus ponendo-ponens and modus tollendo-tollens - help us to establish that there is a probable (not certain) causal relation or that there is not a causal relation between two given phenomena. Modus ponens has a probable conclusion as the phenomena copresence may also have other explanations than causality (for instance, the happening) and modus tollens shows that there is no causal relation if there is no co-presence.

The first thing noticeable regarding causal relation is the temporal succession of the effect-phenomenon. In principle, if a phenomenon is the cause of another, then if we observe the effect occurrence, we can deduce
that its cause also took place. But the mere observation of the events succession is not a necessary confirmation of a causal relation. When we believe we have seen the existence of a causal relation, we have to verify it by methods such as observation or experiment.

The philosopher who first bent on the study and systematization of inductive methods was Francis Bacon, who "explicitly proposed a method for the sciences to replace that of Aristotle. In his book *Novum Organon* of 1620 he set out this method in great detail and it still forms the core of what many people take the scientific method to be" (Ladyman, 2002, p. 18). In Bacon's conception, scientific research is more efficient if it is carried out by two or more persons working together. Any scientific research should have as a starting point the summarization of facts and phenomena, followed then by grouping into tables and their interpretation.

In the first instance, it is essential to observe the phenomena that "is supposed to be undertaken without prejudice or preconception, and we are to record the results of the data of the sensory experience, what we can see, hear and smell, whether of the world as we find it, or of the special circumstances of our experiments. The results of observation are expressed in what are called observation statements" (Ladyman, 2002, pp. 27-28). Then we will achieve an effective grouping of the observed facts, which involves drawing up three tables: the table of essence and presence (*tabula presentiae*), where are included "the cases concordant by the same nature, although in the matter, are not similar" (Bacon, 1957, II, 11), that is, "the cases in which the property, whose form is looked for, is present" (Dima, 1991, p. 208), the table of absence (*tabula absentiae*) with "a summary of the cases where that nature is missing" (Bacon, 1957, 12), therefore "cases as similar as the first, but of which the property looked for is missing (Dima, 1991, p. 207) and the table of degrees and comparisons (*tabula graduum*) in which to be entered "the cases where the researched nature appears in different degrees, namely more or less" (Bacon, 1957, II, 11), that is," the cases in which the property shows different degrees of intensity" (Dima, 1991, p. 207).

After the facts have been grouped in tables, we can proceed to the actual verification of the existence of causal relation by induction, which is based on the "principle of successive eliminations, until the separation of that attribute that would be the essence of the given attribute. For this, will be compared, two by two, the facts from each table and from different tables" (Dima, 1991, p. 209). Practically, the induction method, in the Francis Bacon's conception “involves studying all the information displayed in the tables and finding something that is present in all instances of the phenomenon in question, and absent when the phenomenon is absent, and
furthermore, which increases and decreases in amount in proportion with the increases and the decreases of the phenomenon. The thing that satisfies these conditions is to be found by elimination, and not by guessing” (Ladyman, 2002, p. 24-25).

The methods of verifying causal inferences have been then analyzed by another philosopher, John Stuart Mill in the paper A System of Logic, Ratiocinative and Inductive, came out in 1843. Each method refers to the co-appearance, co-disappearance or covariance of the cause-phenomenon of and effect-phenomenon. These methods are: method of concordance, method of difference, concomitant variation method, combined method of concordance and difference and method of the remnants. Their application involves a close study of the co-presence, co-absence and variations of the phenomena on which it is assumed to be in a causal relation.

In essence, inductive methods assume obtaining scientific knowledge by generalization: there are observed several relevant individual cases (a relevant sample) concerning the presence, absence or variation, whether concomitantly or successively, of certain phenomena and then this knowledge is expanded, and it is considered that in all situations where the cause-phenomenon appears, the effect-phenomenon is to occur. The method is not infallible but is used successfully in many fields of science. Most of us believe that we are on a planet that rotates around the Sun, that a certain amount of arsenic is lethal for life, or that the inhabitants on Earth have appeared as described by the evolutionary theory. But few of us could see how the Earth actually rotates in orbit around the Sun or what the substance called arsenic looks like. Nevertheless, although we talk about things we have never personally seen, we feel entitled to believe in their truth due to the scientific methods used for finding them. Our trust is actually in science and in the methods used by researchers for understanding the world we live in. Further, we use some of this information in our everyday life in order to feel good (for example, we take medicines prescribed by a doctor when we get sick etc.) or achieve our purposes.

4. Causality and Scientific Explanation

Scientific explanation consists of clarifying the aspects and properties of a phenomenon according to scientific laws accepted at a given moment. Therefore, this explanation has a relative character and depends on the level of scientific knowledge at the time it is made. In the study called Philosophy of Science, Alexander Bird shows that, depending on the scientific field and the peculiarities of the analyzed phenomenon, there are several types of
explanations: causal, legal, psychological, psychoanalytic, Darwinian and functional (Bird, 2000, p. 62). Referring to this classification, we can notice that the types of explanations, although resembling in certain aspects, do not overlap entirely. Thus, not every explanation of causal type is also legal (for example, not every stone thrown into a window will break it). We will not analyze here in detail each type of explanation, but from this classification it follows that one and the same phenomenon can be explained by several methods, which does not entitle us to conclude that explanations are subjective, but only that, for pragmatic reasons and depending on the intended purpose, in different situations we resort to different explanations (and we use, not by all means explicitly, laws of several sciences).

Scientific knowledge, which involves explaining the phenomena of various branches of science (studying various aspects of reality), has as fundamental purpose the understanding of the universe in which we live. We are not able to explain what we do not understand, and, consequently, we cannot either know what is incomprehensible (here are talking about understanding and objective knowledge given by the current level of science, not on the subjective ability to understand of an individual). Although many times, within the scientific research it has been considered that the discovery or knowledge of the causes of a phenomenon represents its true explanation, not all philosophers and scientists have this opinion.

As I was saying at the beginning of this article, a pretty common opinion is that "scientific understanding is the reduction of the novel or the unusual to familiar. This essentially subjective conception emphasizes a sense of relief from uncertainty or puzzlement." But not everyone agrees with it and there are philosophers who say that "this conception of scientific understanding simply is not the sense of scientific understanding relevant to scientific explanation" (Lambert, 1991, p. 127) and, accordingly, when we explain something new through certain familiar notions, we do not apply a general rule of knowledge, but it simply happens that, in that particular case, such an explanation be adequate. This opinion was strongly sustained by Carl Hempel: “this view would seem to imply the idea that phenomena with which we are already familiar are not in need of, or perhaps incapable of, scientific explanation; whereas in fact, science does seek to explain such familiar phenomena as the regular sequence of day and night and of the seasons, [...]. Scientific explanation is not aimed at creating a sense at-homeness or of familiarity with the phenomena of nature. That kind of feeling may well be evoked even by metaphorical accounts that have no explanatory true value at all, such as natural affinity construal of gravitation or the conception of biological processes as being directed by vital forces. What
scientific explanation, especially theoretical explanation, aims is not this intuitive and highly subjective kind of understanding, but an objective kind of insight that is achieved by a systematic unification, by exhibiting the phenomena as manifestations of common underlying structures and processes that conform to specific, testable, basic principles. If such an account can be given in terms that show certain analogies with familiar phenomena, then very well” (Hempel 1966, pp. 83-84).

In another conception it is stated that “to have scientific understanding is to be in a position to explain scientifically” (van Fraasen, 1980, p. 154). But this is only accessible to scientists specialized in the field within which the explanation is made, and only exceptionally to other individuals. It is possible to understand a complex phenomenon even though the person cannot give his/her scientific explanation for that phenomenon. Knowing of the relativity theory is outspread in the world at this time, but actually it can be mathematically proven by a small number of physicists.

There are also views according to which scientific understanding consists of the unification of all phenomena under very general scientific laws or theories. But this opinion cannot explain single phenomena, therefore is not complete.

A generally accepted opinion says that we have scientific understanding if we know the laws that govern our Universe. “But the acquisition of new information in the sense of uncovering new facts or new laws is not the sense of scientific understanding relevant to scientific explanation. [...] The moral is that though achievement of scientific understanding involves the acquisition of new information, not all new information constitutes scientific understanding” (Lambert, 1991, p. 129).

Knowing and understanding scientifically a phenomenon implies its integration into a field of science and the possibility of testing the theories related to it. The person who makes a scientific discovery, but does not understand the meaning of his/her discovery has not reached his/her purpose and his/her merits cannot be recognized for he/she did not understand the significance of its discovery. For example, in the history of chemistry, it is famous the Joseph Priestley’s case, who isolated oxygen in the laboratory before Antoine-Laurent Lavoisier, but he did not realize what his discovery means, failed to integrate oxygen (with its specific properties) into the wider context of chemical elements. Thus, the sense of scientific understanding relevant to scientific explanation may be characterized as an answer to the question: How does the state of affairs S fit into theory T?” (Lambert, 1991, p. 130). In other words, when we analyze a phenomenon or
a particular fact, for example, the causes of a person's falling ill, we have to identify the scientific notions regarding that matter and to explain the phenomenon through these theories. If we say that the person got sick out of sorrow or due to a curse, these are not scientific explanations, but if we say that the disease occurred following the infestation with a certain virus, on a low immunity background, this explanation (of course using the adequate medical terms) could represent a scientific explanation. It would be also mentionable in this context that not every scientific explanation is valid, but only that explanation which defines the phenomenon according to the present-day scientific theories. A medical explanation cannot be the one given by Hippocrates about 2000 years ago, but one that takes into account modern theories and medical methods of investigation.

As the conceptions of the contemporary theoreticians of scientific explanation (Carl Hempel, Wesley Salmon and Bas van Fraasen) are very different, and what for one is a valid scientific explanation, for another is unacceptable, Karel Lambert proposes the distinction between global and local scientific understanding. By local scientific understanding, Lambert means “the more common case in applied sciences, [in which] the theory is known or taken for granted but not how a given state-of-affairs fits into that theory. In the case of a global understanding, a batch of diverse states-of-affairs (phenomena) are in need of a theory or another theory is discovered, to accommodate them” (Lambert, 1991, p. 132). Then, in each separate case, we determine what kind of understanding of phenomena we are dealing with, and in this manner are avoided confusions and conflicts of opinion among scientists.

The scientific explanation does not always have as purpose to enhance scientific understanding by discovering or integrating into theory new phenomena. Sometimes a specialist simply wants to explain a singular fact through known scientific theories and, by doing this, he does not bring new information to his field of research, so he does not properly enrich the scientific understanding. But, just as good, it is possible that, through his study, to discover something new and thus to enrich the theory he uses, and in this way he deepens the scientific understanding of the theory.

5. Quantum Indeterminism and Causality

Determinism is the philosophical stream according to which any phenomenon has a cause. So far we have used the concept of causality without defining it properly so time has come to explain it: to say that any phenomenon has a cause means that the phenomenon or event "is so
connected to some previous event that unless the latter The former would not have occurred" (Blanshard, 1970, p. 19). Given the consequences and implications of deterministic ideas, especially as concerns free will and the man’s possibility to choose between good and bad, philosophers have divided determinism into absolute and relative. If we take into account the version that anything or any event is determined beforehand, a series of moral, religious and even juridical issues arise: can we still, in such a situation, punish the one for he killed a peer of his own? If everything is predetermined, it means that the perpetrator of the deed did not actually have freedom of will but simply committed the deed due to a necessary sequence of previous events. Absolute determinism brings us to the situation where no one is responsible for anything and, as a consequence, cannot be punished for evil deeds, nor praised for the good ones. In legal philosophy, this issue of the individual’s moral and legal responsibility in relation to its free will is of great interest and raised many debates.

Relative determinism is a less rigid version of determinism and was also supported, among other philosophers, by John Stuart Mill. In essence, the adepts of relative determinism claim that sometimes the human being acts freely, even if not free from any cause. Virtually, when acting freely, a man is not determined by necessary causes (such as legitimate defense in the case of being attacked) but by subjective causes (desire to get rich, jealousy, etc.). Furthermore, man, by will, can form his character, becoming better. By interpreting in this way people’s actions, it becomes possible to hold people accountable for their own deeds, an essential aspect of carrying out the existence within the society. But the adepts of absolute determinism argue that this is a very fragile argumentation.

The deterministic conception has been favored by the mechanistic vision of the world, a vision imposed by the specifics of classical mechanics laws. According to these theses, the Universe and all existing in it act similar to a mechanism that, if we knew all aspects, we would be able to foresee all its effects.

At the beginning of the 20th century it has been overturned this understanding of the surrounding world due to the discoveries of quantum mechanics. The effect of these discoveries was the introduction of indeterminism into the field of science, by indeterminism being understood that “there is at least one event to which no preceding event is necessary” (Blanshard, 1970, p. 19) or that there are events that do not have necessary effects. The most significant consequence of indeterminism is that I, as an individual, am free in my choices. In a given situation, I choose to tell the
truth, although, as well, under the same circumstances, I could lie. Accordingly, it is strictly my merit that I am an honest person.

Indeterminism explains better the human being’s free will, but it is much more difficult to accept at an intuitive level. Although quantum laws are scientifically demonstrated, their meaning is difficult to assimilate to the ordinary man's mind. On the other hand, although it has been proven that classical mechanics is not a correct and complete scientific theory, its laws meaning is very clear to us. A possible way out of the wood is the assumption that there is, at quantum level, a series of hidden variables that cannot be known by man and for this reason indeterminism appears. Dennis Sciama claims that the probability inherent in quantum processes is subjective (we can only know the past, not the future, namely what, from our point of view, has not yet happened), and is owed to “the observer’s ignorance of some of the determining conditions” (Sciama, 1970, p. 91).

The consequence of accepting indeterminism is that some events do not have the necessary causes, and the classical principle of causality is changed. From some scientists’ viewpoint, such as Stephen Hawking’s, even though we admitted the idea that everything is predetermined (which would involve validation of the hidden parameter theory) for the human being there would not be too many practical consequences since we do not know what this determination would consist of. It is like when a thing has not yet been discovered and scientifically explained: even if you can observe it you can neither explain, nor understand it.

6. Conclusions

One of the most important discoveries of the contemporary sciences of the mind (psychology, neuropsychology etc.) refers to the fact that our mind (the brain) takes its decisions based on both reason and emotions or feelings. This thesis contradicts one of the classical ideas of the Western philosophy, according to which rationality should prevail over the individual’s emotions and feelings. Antonio Damasio discovered that reason without emotions cannot make decisions and co-ordinate beneficially and efficiently man's existence.

Although we cannot talk about knowledge of the world independent of the knowledgeable subject, there is nevertheless a consensus (in scientific communities) on how to interpret the information that our senses, rationality and affectivity produce. In the process of acquiring knowledge, which is a multifaceted, diverse one, not unique and highly objective, the concepts of explanation and causality retain a privileged role, even though
their meaning has changed from the way they were understood in classical epistemology.

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